The Builder.

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PURSUING our observations on the building-stone of CAEN and its neighbourhood, it seems desirable, while repeating our caution against the use, externally, of the bottom bed—the *franc-banc*—that we should mention the opinions of some of the merchants who are disposed to find other reasons for the occasional failure of the stone rather than admit that they ship stone which must almost certainly decay. One considered that it was the stone which came from *wet* quarries, quarries to which the water gained access, that decomposed when exposed to the action of the weather; and a second maintained stoutly that the bottom bed was as good as the others,—that the stone from it was always chosen by the builders in England (without knowing any thing about its position in the quarry of course), and that when Caen stone failed, it was an evidence that the *sea-water* had been over it. To keep back the bottom bed they thought was out of the question, as they would in that case be obliged to charge a greater price for the stone they did sell.

We are not prepared to assent to these opinions, especially as the whole tenor of their conversation shewed clearly (notwithstanding they would not admit it in words) that they had little real faith in the durability of the bottom bed.

The injurious effect of sea-water on stone has been often urged, but has few believers at this time. The failure of the stone in Blackfriars-bridge was ascribed to the action of sea-water; but recent inquirers have found more likely causes in examining the position whence the stone was taken. In Portland, Mr. Smith tells us, there is a bath formed of Portland stone, which has been there, partly immersed in the sea, for forty or fifty years, and of which the stone is quite sound.

Bad stone would probably be injured by sea-water, but we are not disposed to think that good sound stone would be. At all events, in respect of its being the sole cause of the decay of Caen stone, the opinion is not tenable for an instant; there being much of the stone used in modern times in the immediate locality which is in a bad state.

The fact that when the early churches in Caen were built, the masons probably restricted themselves for a supply of stone to the upper beds, not desiring large blocks, as they had but rude means for raising them, may go some way towards explaining the good state in which much of the masonry remains both there and in England where it was used.

The difference to be observed, looking at some of the modern buildings, between parts of the structure is very striking. At one of the guard-houses, for example, perhaps fifty years old, while the majority of the columns are sound and perfect, two or three of them are honeycombed all over, and fast falling to ruin.

Amongst the older modern buildings which seem to have stood well, is that appropriated to the law courts, built perhaps seventy years ago, and which is now in the course of repair. The large Ionic portico and remainder of the entrance front have been scraped, and probably repaired, and looks the same as new. The columns of this portico have a curiously ugly effect, in consequence of the "swell" given to them, which renders them larger in their diameter at about one-fourth of their height from the ground than they are at the bottom: they look like gigantic skittles or attenuated water-butts.*

In some even more recent buildings, where care was used, the stone looks very beautiful. An instance of its differing durability presented itself to us in the churchyard of the ancient church of *La Haute Allemagne*, close to the quarries, where we found some of the tombstones, dated 1833, much decayed, while others, marked 1814, were as perfect in all their lines as when first cut; and these not more so than some parts of the tower of the church (the only part of the original edifice remaining, restorers having been at work), which, although 700 years old, appear quite sound.

We observed here and elsewhere that the stone from the *franc-banc* is used not merely for mangers, troughs, and other purposes, but is preferred by the local builders for quoin-stones and window-dressings, because it is softer; and speedy decay, the certain result, is not considered by *them* a vital objection!

As we have already said, when the Caen stone is cut up and dry, it is scarcely possible to say what bed it is from, although when first quarried or thoroughly wetted, the bottom bed is easily to be distinguished; and we may add to our remarks in the last paper under this head, that the stone from that part of the quarry has then a *soapy* feel, hangs to the rasp when scraped, and is sometimes redder in grain.

The consumer, in England, is necessarily to a great extent at the mercy of the merchants who supply it: it is necessary for the latter, if they would maintain the market, to use the greatest care, and to justify the confidence which must per-force be placed in them.

We must not have it inferred from what has been said, that none of the stone from the best beds decays: we are not by any means in a position to say so: indeed it is more than likely that there may be defective stone at times in each of the beds, but we have no reason to doubt that much of it is an admirable and lasting material.

Further, there are particular positions in which it is more liable to decay than in others. Thus in several buildings we observed that the Caen stone immediately on the plinth was decomposed, while in all other parts it was sound. This may result either from the retention of moisture in the bottom course by the harder and less absorbent stone employed for the plinth beneath, or by the splashing up of the rain-water from the projecting stone. The same effect is sometimes observable at the same point in brick buildings with a stone plinth.

The stone occasionally used for plinths of buildings where the *Allemagne* stone is used above, as, for example, at the *Havre* Museum, described in a previous paper, is from

THE RANVILLE QUARRIES,

a few miles off,—a stone which is, however, chiefly used for water-works, for which purpose it is said to endure well.

These quarries are seen on the *left* bank of the Orne, when going up that river towards Caen, five or six miles perhaps from that city. They are opened in the face of the cliff, 18 or 20 feet from the surface; have loose and friable beds at top, and yield, apparently, but a small quantity of good stone. The beds are level. Judging from the quantity of *débris* lying about, it would seem that these quarries are ancient, and have been worked many years: they extend perhaps half a mile along the banks.

The material is a coarse-grained highly-chrystalline limestone, which may have been oolitic, and that which comes from the *good* beds seems well calculated to endure. The quay walls at *Havre* are faced with it, and appear to stand well. We understood that a quantity of it had been sent to Dover for the Government works now going on there; but it was thought in Caen not to be a good specimen. There is a considerable difference in the stone from different parts of the same quarry.

It appears to be a general rule, though not without exceptions, that the *coarse-grained* limestones and oolites will stand the weather better than those with finer grain; while in the case of sandstones the reverse is thought to be the case,—those of the finest grain lasting the longest. We shall shortly lay before our readers an account of the *Aubigny Quarries*, near *Falaise*, which produce what appears to be an excellent stone, and is now being brought into the market.

In the present and the previous papers we have laid before our readers some general observations on the building stone of Caen, but we are prepared, and hope, to do something more than this. When in the quarries, we marked on the untouched rock certain portions of each bed, saw them removed from their position, and shipped for England. These specimens, to the extent of some tons in weight, are now in our hands, and we propose, in conjunction with Mr. Smith, whose added experience will ensure accuracy, to subject them to a series of experiments, both chemical and mechanical, and lay the results before the public. To carry these out thoroughly and carefully will of course require time, but none will be lost.

GEORGE GODWIN.

* We measured the diameter of one of these columns, and found it 11 feet 3½ inches at the bottom, while at one-fourth its height from the ground it is 11 feet 6 inches.

THE STORY OF BUILDING.

IT was a long time ago, and we can hardly judge of it, when man first began to build. He pulled down branches one day, perhaps, and set them up against a rock-side, or around the parent trunk, and covered them with twigs and leaves, and crept in under for rude shelter, and thus began to build. Not barbarously though, perhaps,—for he *learnt* barbarism afterwards,—sank into the Indian of America, the South Sea islander, the rootdigger and bushman of the Cape, by gradual influences not yet begun. He was still doubtless in the balmy East; he had the spreading shadow of the forest for noonday shade, and for cover from the rain—store for a few fruits—shelter, perhaps, if he were luxurious, from the night dew in his sleep—he had built himself a house and home.

Presently his sons ranged abroad, emigrated, spread around into other districts of the earth, and founded the small beginnings of the nations. Their diversity was greater now than before. Different climate, different life, different circumstances in every way, formed and moulded them in difference. Now some theorists would have us think that still their houses and homes would be the same,—the old pattern of their father in the eastern garden alike in the sultry south and the cold tempestuous north, in the luxuriance of the forest and amongst the barren stones of the mountains. Innovation, they tell us, must be

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